UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

August 17, 2007

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Moses Lake Wellfield Superfund Site

FROM: David E. Cooper, Chair
National Remedy Review Board
Office of Superfund Remediation and Technology Innovation

TO: Daniel Opalski, Director
Office of Environmental Cleanup
U.S. EPA Region X

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Moses Lake Wellfield Superfund Site in Moses Lake, Washington. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator announced the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board evaluates the proposed actions for consistency with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and relevant Superfund policy and guidance. It focuses on the nature and complexity of the site; health and environmental risks; the range of alternatives that address site risks; the quality and reasonableness of the cost estimates for alternatives; regional, state/tribal, and other stakeholder opinions on the proposed actions; and any other relevant factors.

Generally, the Board makes advisory recommendations to the appropriate regional decision maker. The Region will then include these recommendations in the administrative

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record for the site, typically before it issues the proposed cleanup plan for public comment. While the Region is expected to give the board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the Region's final decision. The Board expects the Regional decision maker to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. It is important to remember that the Board does not change the Agency's current delegations or alter in any way the public's role in site decisions.

Overview of the Proposed Action

The site encompasses potential source areas around the former Larson Air Force Base. The Army Corps of Engineers performed the remedial investigation (RI) and feasibility study on behalf of the Department of Defense. The RI identified potential source areas scattered throughout the area and approximately 690 acres of contaminated ground water. This remedy will address 12 source areas and five contaminated ground water plumes. The plumes represent two different water bearing layers at three locations. The preferred alternative for the source areas include additional soil investigation using soil gas surveys, test pitting, and soil sampling. Waste above cleanup levels will be removed and sent off site for disposal. The preferred alternative for the two larger upper ground water contaminant plumes is ground water extraction and ex-situ treatment. For the remaining aquifers, the preferred alternative would include institutional controls, alternate water supplies such as new wells or point-or-use treatment, and long-term monitoring.

NRRB Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Dennis Faulk, Marcia Knadle, and Ted Yackulic on July 26, 2007. Based on this review and discussion, the Board offers the following comments:

1. The package presented to the Board did not provide sufficient information to evaluate fully the entire remedy described in the draft proposed plan, nor the effectiveness of remedial alternatives in meeting remedial action objectives. The Board notes significant data gaps in the material the Region presented. For example, the Board believes the Region needs more information to address the potential for perchlorate releases at rocket research area; the potential presence of principal threat wastes (e.g., dense non-aqueous phase liquids (DNAPL) pooled on subsurface confining layers), and the potential of stringers of tricholorethylene (TCE) in the vadose and/or saturated zones. Similarly, the Board recommends the Region develop information to evaluate the effectiveness of possible contingent remedial alternatives for the Roza 2 aquifer.

Notwithstanding these issues, ground water concentrations exceed maximum contaminant levels (MCLs); and the Board agrees that there is a basis for action on the ground water contamination within the Roza 1 aquifer. Consistent with Agency policy, the Region

should address ongoing sources early to prevent ground water recontamination. Therefore, the Board recommends that the Region proceed with either a phased or an interim remedy, consistent with the Ground Water Presumptive Strategy (Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water At CERCLA Sites (EPA 540-R-96-023, October 1996)). For example, it may be appropriate to address Area 20 as a separate Operable Unit and use the data collected during this response action to inform Agency decision-making for subsequent phases at the site. Other concepts from the Ground Water Presumptive Strategy that the Board recommends for this situation are: determination of aquifer restoration potential, utilization of early action to reduce site risks earlier in the site remediation process to control further contaminant migration and provide additional site characterization information, and identification of DNAPL sources. These steps can have a significant impact on the cost, duration, and effectiveness of the preferred alternative. Finally, a more thorough understanding of the uncertainties associated with these issues should be developed and discussed in the decision documents.

2. The suitability of pump and treat (P&T) or in-situ treatment (e.g., injection of permanganate or emulsified zero valent iron (eZVI)) is difficult to assess given the limited characterization information and remedy design details provided in the package. The types of contamination present, their spatial distribution, and hydrogeologic features (such as preferential flowpaths in fractured bedrock) can significantly complicate remedy implementation. The suitability of P&T in the fractured rock environment at the site is not established by the few details presented. The placement and distribution of permanganate or eZVI in fractured rock also can be problematic, even if the source areas were well defined. Monitored natural attenuation (MNA) also is mentioned as a potential alternative for dissolved phase TCE in ground water; however, decreasing concentration trends and attenuation processes (dispersion, sorption, degradation, transformation, etc.) were not adequately documented in the package (neither was the proposed long-term monitoring plan).

The package provided to the Board suggests that extensive sampling is expected to take place in the future, including placement and sampling of numerous new wells. The Region indicates that installing a P&T system and using it both for remediation and as a means of further analyzing the hydrogeology of the site is not inconsistent with the Agency's actions at other sites. The Board notes that while this may be the case, it also frequently leads to the need to revise remedies after construction. The Board recommends that the Region continue to develop more site characterization data (source nature and location, plume extent, ground water flow in the fractured rock, etc.) that will be useful before a remedy is implemented.

3. The package indicated that soil excavations would be triggered by exceeding soil concentrations based on Washington Model Toxics Control Act (MTCA). The Board recommends that the Region further evaluate exposure pathways for soil areas and develop additional information on the extent of contamination in soil source areas and surface disposal sites. The Board also recommends the Region consider developing a contingent approach for different soil source areas. The Region could develop decision-making criteria that could be used to determine whether removal or containment for lesser-contaminated areas is more

appropriate. The decision document should describe how the soil concentration triggers relate to health risk and how remedial actions would be triggered as work progresses during design and remediation.

4. It does not appear to the Board that MTCA Method C is an ARAR at this site, but it may be appropriate to use it as a "to-be-considered" guidance (TBC) in developing soil cleanup levels.

5. The package that the Board reviewed lacked detailed information regarding the actions currently underway to protect users of private wells from exposure to contamination above the MCLs. The Board recommends that the decision documents explicitly include continued identification and monitoring of appropriate private wells as a component of the ground water remedy. The ground water alternatives should also include provision of whole house filtration systems, or an alternate water supply, for any residential wells for which samples are found to exceed MCLs. The Board recommends that this be a component of all ground water alternatives, with the exception of No Action.

6. The package presented to the Board includes a remedial action objective to reduce risk to human and ecological receptors, and the proposed plan calls for clean-up actions on contaminated soils to "protect human health and the environment." However, the materials provided to the Board indicated that the ecological risk assessment conducted at the site discounted ecological risk from ground water releases into Moses Lake and identified no specific terrestrial ecological risks. In contrast, during the discussion with the Board, the Region indicated that phytotoxicity might be occurring at the Site in some areas. If phytotoxicity were occurring, this would suggest that there are contaminants of potential concern that have not been adequately characterized. The Board recommends that the Region provide additional information to clarify whether effects in the areas noted as impacted result from physical disturbance or phytotoxicity. In addition, the Board recommends that the Region ensure that statements in the decision documents regarding the need to take remedial action based upon protection of the environment are consistent with statements on the existing ecological risk.

7. The costs presented to the Board in Attachment 1 (Draft Proposed Plan) did not provide sufficient detail to undertake a thorough evaluation. For example, DOD has not yet fully characterized waste source areas, the extent of the ground water plumes, or the extent of perchlorate in ground water, which make meaningful cost estimation difficult. These uncertainties could affect the total cost of the response action at this site. In addition, DOD identified a range of timeframes for ground water pump and treat system operation that is not consistent with the timeframe used to estimate remedy cost. Finally, the cost backup provided in Attachment 4 (Groundwater Costs) and 5 (Site 20 Costs), taken from the Army Corps draft Feasibility Studies, are inconsistent with those provided in Attachment 1. Therefore, the Board cannot comment on the cost effectiveness of this proposed action at this time. The Board recommends that the Region reconcile the cost information, prepare any necessary backup cost documentation, and present the information in site decision documents.

The Board appreciates the Region's efforts in working together with the potentially responsible parties, State, and community groups at this site. We request that a draft response to these findings be included with the draft Proposed Plan when it is forwarded to your OSRTI Regional Support Branch for review. The Regional Support Branch will work with both your staff and me to resolve any remaining issues prior to your release of the Proposed Plan. Once your response is final and made part of the site's Administrative Record, then a copy of this letter and your response will be posted on the Board website (http://www.epa.gov/superfund/programs/nrrb/).

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 603-8763 should you have any questions.

cc: J. Woolford (OSRTI)
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